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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/074,792 | 02/12/2002 | Masaaki Hayama | MAT-6660US2 | 8079 |

7590 07/25/2003

Ratner & Prstia
P.O Box 980
Valley Forge, PA 19482

[REDACTED] EXAMINER

CHAMBLISS, ALONZO

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

2827

DATE MAILED: 07/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/074,792 | HAYAMA ET AL. |
| | Examiner | Art Unit |
| | Alonzo Chambliss | 2827 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 5/14/03/amendment B .
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 13-28 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 February 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 09/173,288 .
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Amendment B filed on 5/14/03 has been fully considered and made of record in Paper No. 5.

Drawings

2. The drawings filed on 2/12/02 are approved by the examiner.

Specification

3. The amendment to the abstract and the title have been approved by the examiner. Therefore, the objection to the abstract and the title is withdrawn.

Response to Arguments

4. Applicant's arguments filed 5/14/03 have been fully considered but they are not persuasive.

Applicant alleges that " a via having a step " is not taught or suggested in the Hayama reference. This argument is deemed unpersuasive because Hayama discloses that it is also possible to form the pit 22 or slot 21 which has a configurations other than a cylindrical shape (see English translation, paragraphs 44 and 45. Thus, Hayama is not limited to the shape seen in the figures but can have several different shapes without departing from the scope of the invention. Applicant refers to the specification at page 7, line 14-23 to support the importance of the step via. However, that portion of the specification did not point out the main advantage of having a step

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configuration just that the width of the second groove can be made smaller than the first by adjusting the excimer laser. Also, the changing shape of the structure is an obvious matter of design choice within ordinary skill in the art and the difference in the shape of the structure does not make the device operating differently. Note that in the instant specification applicant does not describe the step shape as essential or critical or the only shape that could operate the claimed invention. *In re Peters*, 723 F.2d 891, 221 USPQ 952 (Fed. Cir. 1983). Therefore, one skilled in the art at the time of the invention would readily recognize modifying the shape of the slot to have a step configuration, since step configuration of the pit would provide a fine pattern shape for Ag paste in the intaglio printing.

Applicant alleges that Saitou fails to disclose teaching or suggestion of a convex via having a step as defined in all of Applicant's pending claims. This argument is deemed unpersuasive because Saitou is not relied upon to teach a convex via having a step as defined in all of Applicant's pending claims. Hayama is relied upon to disclose this limitation.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 13-28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al. (JP 7-169635) as applied to claims 13 and 14 above, and further in view of Saitou et al. (U.S. 5,162,240).

With respect to Claims 13 and 14, Hayama teaches a ceramic substrate 2 with a first and third pattern 35 each having convex via, being formed on the ceramic substrate 2 by a transfer printing technology through an intaglio printing using a flexible resin substance. An insulation layer 33 is formed on the first conductive pattern 35 and a second and fourth conductive pattern 32, 34 each electrically connected with the first and third conductive pattern 35, respectively by the via (see English translation, paragraphs 90-111, Figs. 8 and 10-13). Hayama discloses that it is also possible to form the pit 22 or slot 21 which has a configurations other than a cylindrical shape (see English translation, paragraphs 44 and 45. Thus, Hayama is not limited to the shape seen in the figures but can have several different shapes without departing from the scope of the invention. Also, the changing shape of the structure is an obvious matter of design choice within ordinary skill in the art and the difference in the shape of the structure does not make the device operating differently. Note that in the instant specification applicant does not describe the step shape as essential or critical or the only shape that could operate the claimed invention. In re Peters , 723 F.2d 891, 221 USPQ 952 (Fed. Cir. 1983). Therefore, one skilled in the art at the time of the invention would readily recognize modifying the shape of the slot to have a step configuration, since step configuration of the pit would provide a fine pattern shape for Ag paste in the intaglio printing.

With respect to Claims 15 and 22, Hayama teaches a meshed pattern is provided in a part of the conductive pattern (see Figs. 12 and 13). With respect to Claims 16 and 23, Hayama teaches a shield pattern (i.e. the outer most pattern of the conductive pattern 35) is provided in a part of the conductive pattern 35 (see Fig. 13). Furthermore, any pattern on the outer most part of conductive pattern 35 serves as a shield pattern, since this pattern shields the inner conductive patterns 35 from the outside periphery of the device. With respect to Claims 18 and 25, Hayama teaches a dielectric layer 33 formed on a part of the ceramic substrate 2 (see Figs. 12 and 13).

With respect to Claims 17 and 24, Hayama fails to disclose the ceramic substrate provided with a through hole filled with an electroconductive substance and burned and the via is disposed on the via is disposed on the through hole. However, Saitou discloses the ceramic substrate 11 provided with a through hole 13 filled with an electroconductive substance and burned and the via 22 is disposed on the via is disposed on the through hole (see col. 6 lines 38-68). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the substrate with a through hole with the device of Hayama, since the substrate with the through hole would improve the electrical connection and stability between the thick substrate and a thinner insulating wiring substrate as taught by Saitou.

With respect to Claims 19, 20, 26, and 27, Saitou discloses a LSI chip 30 mounted o a part of second conductive pattern directly bonded to pad 23, wherein the LSI chip 30 is face down electrically connected through an electroconductive paste 32 (i.e.solder) applied o the top of a fine bump provided on the second conductive pattern.

The fine bump is the portion of the electroconductive substance that protrudes passes the top portion of the insulation material 21 (see col. 8 lines 34-42; Fig. 1). Hayama discloses a fine bump formed by using a second groove 22, which is disposed on the intaglio 20 at a place corresponding to a pad of the LSI chip 30 taught by Saitou.

With respect to Claims 21 and 28, Saitou discloses an LSI package is mounted on part of the second conductive pattern face down and electrically connected through a lattice of lands with a pitch between terminals that is 200micrometers (i.e. 200 micrometers = .2mm). The lattice is on the second conductive patterns (see col. 2 lines 17-25;Fig. 1).

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

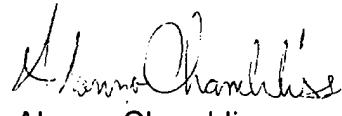
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/July 16, 2003



Alonzo Chambliss
Patent Examiner
Art Unit 2827